



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,720	02/11/2004	Dong-Jae Shin	5000-1-495	2829
33942 7590 03/21/2007 CHA & REITER, LLC 210 ROUTE 4 EAST STE 103 PARAMUS, NJ 07652			EXAMINER LEE, DAVID J	
			ART UNIT	PAPER NUMBER
			2613	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		03/21/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/776,720

Applicant(s)

SHIN ET AL.

Examiner

David Lee

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 February 2004.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-17 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-17 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 11 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 13-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 13 recites the limitation "the n-th FP laser" and "the n-th DP." There is insufficient antecedent basis for this limitation in the claim.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 3, 5-9, and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. (US Pub. No. 2001/0004290 A1).

Regarding claim 1, Lee teaches a WDM (Wavelength Division Multiplexing) optical transmission apparatus for outputting an optical signal having a plurality of channel signals over an external waveguide (see fig. 3), comprising: a light source for outputting incoherent light of a prescribed wavelength bandwidth (note "ILS" of fig. 3 – Incoherent Light Source); a circulator having first to third ports for outputting the incoherent light received at the first port coupled to

Art Unit: 2613

the light source to the second port and for outputting an optical signal received at the second port to the third port coupled to the external waveguide (note “CIR” of fig. 3 – Circulator; note that the first port is coupled to the ILS and outputs light to the second port, and the light received at the second port is outputted to the third port – “Multi-channel WDM signal”); a WGR (Waveguide Grating Router) having a multiplexing port (MP) coupled to the second port of the circulator and a plurality of demultiplexing ports (DPs) for performing WD (Wavelength Division) demultiplexing on the incoherent light received at the MP to output WD-demultiplexed signals to the plurality of DPs and for performing WD multiplexing on a plurality of channel signals received at the plurality of DPs to output WD-multiplexed signals to the MP (note the (D)MUX – also known as a WGR of fig. 3: the WDR comprises a multiplexing port which receives the incoherent light. The received light is then demultiplexed by the plurality of DPs); and a plurality of FB (Fabry-Perot) lasers respectively connected to the DPs of the WGR (note the plurality of “F-P LD” of fig. 3 – Fabry-Perot Laser Diode), each FP laser having a laser cavity, an antireflection coating layer deposited at one end of the laser cavity facing a corresponding DP, and a high reflection coating layer deposited at the other end of the laser cavity (this is the structure of an FP LD – see also e.g., paragraph 0054), wherein an optical injection efficiency increases and an influence of reflected light is reduced resulting in facilitation of a wavelength-locked phenomenon (see e.g., fig. 10 and fig. 12; see also paragraph 0012).

Regarding claim 3, Lee teaches that the FP lasers each output a wavelength-locked optical signal when a lasing mode having a wavelength equal to that of an injected incoherent light is found (see e.g., paragraph 0046).

Regarding claim 5, Lee teaches that the FP lasers output an optical signal amplified by the injected light when there is no lasing mode having a wavelength equal to that of the injected incoherent light (see e.g., paragraph 0084).

Regarding claim 6, Lee teaches that the light source comprises an Amplified Spontaneous Emission (ASE) source for generating an incoherent light having a prescribed wavelength bandwidth (see e.g., first line of paragraph 0084).

Regarding claim 7, Lee teaches that the ASE comprises an Erbium Doped Fiber Amplifier (EDFA) for generating an ASE light (see e.g., first line of paragraph 0084).

Regarding claim 8, Lee teaches that the EDFA comprises an erbium-doped fiber (see e.g., first line of paragraph 0084).

Regarding claim 9, Lee teaches that the EDFA further comprises a pump laser diode for pumping the erbium doped fiber (see e.g., paragraph 0084).

Regarding claim 13, as it is best understood in view of the 112 rejection above, Lee teaches that the n-th FP laser includes a laser cavity having a prescribed gain and an antireflection coating layer deposited at one end of the laser cavity facing the n-th DP (see e.g., paragraphs 0052-0053).

Regarding claim 14, as it is best understood in view of the 112 rejection above, Lee teaches that the FP laser further includes a high reflection coating layer deposited at the other end of the laser cavity (this is the structure of an FP laser).

Regarding claim 15, as it is best understood in view of the 112 rejection above, Lee teaches that the FP laser noise immunity increases as its extinction ratio increases (see e.g., fig. 10).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2, 4, 10-12, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al.

Regarding claims 2, 4, 10-12 and 16, Lee does not expressly disclose specific numbers for values such as reflection rate and ambient temperatures. However, absent any teaching of criticality, it would have been a matter of design choice, or given the general environment of the prior art, it would have been obvious to obtain an optimal or requested value by routine experimentation. Therefore, a reflection rates of 0.1-30% and 70%-100% for the antireflection coating layer and the high reflection coating layer would have been attainable for one skilled in the art. In addition, an FP laser variation of about 0.1% nm/Celsius would have been attainable for one skilled in the art. Moreover a wavelength-locked phenomenon and an optical amplification occurring at temperatures of 31 and 25-37 degrees Celsius would have been attainable for one skilled in the art. Finally, a 3-db line width of the incoherent light corresponding to about 40% of a channel spacing of the WGR would have been attainable for one skilled in the art.

Art Unit: 2613

7. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. in view of McGhan et al. (US Patent No. 6,842,587 B1).

Regarding claim 17, Lee does not expressly disclose that the light source further comprises a semiconductor optical amplifier (SOA). However, it is well known in the art to use SOAs to provide light amplification. For example, McGhan teaches a tunable laser diode (21 of fig. 2) which comprises an SOA (22 of fig. 2) to provide light amplification. It would have been obvious to a skilled artisan at the time of invention to incorporate an SOA, such as the one taught by McGhan, in the system of Lee in order to provide amplification and to boost signal levels.

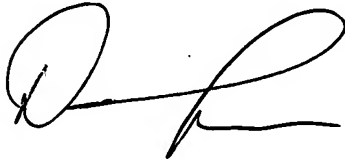
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Lee whose telephone number is (571) 272-2220. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

Art Unit: 2613

like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



David Lee  
Patent Examiner



**JASON CHAN**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 2600**